

Claims

1. A method of controlling link adaptation in a packet radio system, the method comprising:

receiving a CQI (channel quality indicator) report, the CQI report including a number of parallel multi-codes, a transport block size, TBS, and a modulation scheme to be used in link adaptation;

calculating an effective code rate, ECR, based on the received CQI report;

when a number of parallel multi-codes of the CQI report exceeds a number of multi-codes available for transmission calculating new estimates for the effective code rate, ECR, and the transport block size, TBS, based on a ratio of the number of multi-codes of the CQI report and the number of multi-codes available for transmission, and executing link adaptation based on new estimates for the effective code rate, ECR, and the transport block size, TBS.

2. The method of claim 1, when calculating the new estimate for the effective code rate, ECR, the method further comprising:

calculating an increase factor by taking a logarithm of the ratio between the number of multi-codes by the CQI report and the maximum number of multi-codes available for transmission and multiplying the result by the number of ten; and

calculating the new estimate for the effective code rate, ECR, based on the calculated increase factor and the effective code rate, ECR, of the CQI report.

3. The method of claim 2, the method further comprising:

forming a table with the function of an energy to symbol to noise ratio, E_s/N_0 , and the effective code rate, ECR; and

obtaining the new estimate for the effective code rate, ECR, based on the table with the function of the energy per symbol to noise ratio, E_s/N_0 , and the effective code rate, ECR, the increase factor and the modulation scheme.

4. The method of claim 1, when calculating the new estimate for the transport block size, TBS, the method further comprising:

quantizing the product between the new estimate for the effective code rate, ECR, a number of bits per transmission time interval, TTI, for each multi-code and the maximum number of multi-codes that the base station has available for transmission, to the nearest possible transport block size.

5. The method of claim 1, wherein the effective code rate, ECR, proposed by the CQI report is calculated based on the ratio of the transport block size, TBS, of the CQI report to a product of the number of multi-codes and the number of bits per transport time interval, TTI, for each multi-block.

6. The method of claim 1, further comprising selecting the modulation scheme to be used in link adaptation based on the received CQI report, the modulation scheme being QPSK (quadrature phase shift keying) or 16QAM (16-quadrature amplitude) modulation scheme.

7. The method of claim 6, further comprising selecting the 16QAM modulation scheme, when the number of multi-codes that the base station has available for transmission is smaller than the number of multi-codes of the CQI report.

8. The method of claim 1, wherein the packet radio system is an HSDPA (High Speed Downlink Packet Access) radio system.

9. A packet radio system, the packet radio system being configured to:

- receive a CQI (channel quality indicator) report including the number of parallel multi-codes, the transport block size, TBS, and the modulation scheme to be used in calculating a link adaptation estimate;

- calculate an effective code rate, ECR;

- calculate new estimates for the effective code rate, ECR, and the transport block size, TBS, based on a ratio of the number of multi-codes of the CQI report and the number of multi-codes that the packet radio system has available for transmission, when the number of parallel multi-codes of the CQI report exceeds the number of multi-codes that the packet radio system has available for transmission; and

- execute link adaptation based on the new estimates for the effective code rate, ECR, and the transport block size, TBS.

10. The packet radio system of claim 9, wherein the packet radio system is further configured to calculate the new estimate for the effective code rate, ECR, by:

- calculating an increase factor by taking a logarithm of the ratio between the number of multi-codes by the CQI report and the maximum number of multi-codes that the packet radio system has available for HSDPA transmission and multiplying the result by the number of ten; and

calculating the new estimate for the effective code rate, ECR, from a function of the calculated increase factor and the effective code rate, ECR, of the CQI report.

11. The packet radio system of claim 10, wherein the packet radio system is configured to:

form a table with the function of an energy to symbol to noise ratio, E_s/N_o , and the effective code rate, ECR; and

obtain the new estimate for the effective code rate, ECR, based on the table with the function of the energy per symbol to noise ratio, E_s/N_o , and the effective code rate, ECR, the increase factor and the modulation scheme.

12. The packet radio system of claim 9, wherein the packet radio system is configured to calculate the new estimate for the transport block size, TBS, by:

quantizing the product between the new estimate for the effective code rate, ECR, a number of bits per transmission time interval, TTI, for each multi-code and the maximum number of multi-codes that the packet radio system has available for transmission, to the nearest possible transport block size.

13. The packet radio system of claim 9, wherein the effective code rate, ECR, proposed by the CQI report is based on a ratio of the transport block size, TBS, of the CQI report to a product of the number of multi-codes and the number of bits per transport time interval, TTI, for each multi-block.

14. The packet radio system of claim 9, wherein the packet radio system is configured to select the modulation scheme to be used in link adaptation based on the received CQI report and the modulation scheme is one of QPSK (quadrature phase shift keying) and 16QAM (16-quadrature amplitude) modulation scheme.

15. The packet radio system of claim 14, wherein the packet radio system is configured to select the 16QAM modulation scheme, when the number of multi-codes that the base station has available for transmission is smaller than the number of multi-codes of the CQI report.

16. The packet radio system of claim 9, wherein the packet radio system is an HSDPA (High Speed Downlink Packet Access) radio system.

17. A packet radio system, said system comprising:

receiving means for receiving a channel quality indicator report, the channel quality indicator report including a number of parallel multi-codes, a transport block size, and a modulation scheme to be used in link adaptation;

first calculating means for calculating an effective code rate based on the received channel quality indicator report;

second calculating means for calculating new estimates for the effective code rate when the number of parallel multi-codes of the channel quality indicator report exceeds a number of parallel multi-codes available for transmission; and

executing means for executing link adaptation when the number of parallel multi-codes of the channel quality indicator report exceeds a number of parallel multi-codes available for transmission, based on new estimates for the effective code rate and the transport block size.